What works for whom in a computer-mediated communication intervention in community psychiatry? Moderators of outcome in a cluster randomized trial


Objective: An intervention to structure patient–key worker communication has been tested in a randomized controlled trial. The aim of this paper was to investigate effectiveness of the intervention in terms of moderators of effectiveness.

Method: A total of 507 patients with schizophrenia were included. Moderators of effectiveness were investigated using two-way ANOVAs.

Results: Patients with a better relationship with their key worker and a shorter duration of illness at baseline benefited more from the intervention in terms of quality of life. Patients who received the intervention who were in competitive employment or had a shorter duration of illness showed greater reduction of unmet needs. Older patients receiving the intervention had better treatment satisfaction.

Conclusion: Outcome of the intervention was moderated by patient characteristics. Moreover, the moderating characteristics varied depending on the specific outcome. Evidence on moderators is very limited, even though, they are significant for understanding, targeting and implementing complex interventions.

Significant outcomes

- There was a main effect of the intervention.
- The effects of the intervention differed depending on the quality of the therapeutic relationship, duration of illness, employment situation and age.

Limitations

- The lack of research on moderators of psychosocial interventions in community-based mental health limits the conclusion in the present study.
- In the given design of the study, it was not possible to test whether specific elements of the intervention were related to the moderator effects.
Introduction

People with schizophrenia living in the community are a vulnerable group, often characterized by complex needs and disabilities in several life domains. Treatment in community-based services is mostly performed by multi-professional teams with a designated key worker responsible for planning and implementing care interventions. A number of evidence-based psychosocial interventions intended to support and increase the effectiveness of community-based care are also well established (1–4). Furthermore, the therapeutic relationship between patient and clinician has been considered pivotal for care delivery in community-based mental health services, and qualities of this relationship have been found to predict both compliance and treatment outcome across different patient groups and service settings (5).

Although the regular meetings between a patient and his key worker seem to be of vital importance for the process and outcome of community-based mental health care, the content and communication of these routine contacts has been the subject of little systematic research, and no evidence-based method to structure these meetings in order to improve treatment outcome exists. Recently, a novel intervention structuring communication between patients and key workers in routine meetings by means of a regular, two-monthly assessment of satisfaction with various life domains and aspects of current treatment was implemented, the DIALOG intervention. The intervention was supported by computer-mediated technology and intended to ensure that a range of life domains and treatment aspects were consistently addressed and patients’ perspectives always elicited. The satisfaction ratings were fed back immediately in the meeting to feed into patient–key worker discussions and have an impact on subsequent care and the therapeutic relationship. In a cluster randomized controlled trial, the new intervention had a significant positive effect after 1 year on subjective quality of life (ES = 0.20), treatment satisfaction (ES = 0.27) and prevalence of unmet needs (ES = 0.22) (6). These results raised the question whether this intervention was moderated by baseline characteristics of the patients, and thus more or less effective in subgroups of patients compared with TAU. Moderators are variables preceding assignment to treatment which interact with the treatment variable in affecting outcome.

Aims of the study

The aim of this study was investigate whether the effectiveness of the DIALOG intervention was differed depending on patient sociodemographic, clinical and social characteristics at baseline, i.e. to explore the interaction between baseline moderator variables and the DIALOG intervention.

Material and methods

Design

The study used a cluster randomized controlled trial design. Key workers were randomly assigned to either the experimental intervention or treatment as usual (TAU), with a pre–post design over 1 year. Cluster randomisation of key workers was used in order to avoid potential contamination, i.e., the key worker changing their practice with the control as well as the intervention group. Collection of baseline data began in December 2002, and 1-year follow-up data collection ended in May 2005. At both time points, key workers and patients were interviewed by researchers who had no involvement in the patients’ care. For more detailed information concerning design and randomisation procedures see Ref. (6).

Settings and participants

The study was conducted in community mental health services in Granada (Spain), Groningen (the Netherlands), London (UK), Lund (Sweden), Mannheim (Germany) and Zurich (Switzerland). The participating teams were multidisciplinary and provided comprehensive care programmes for people with severe and enduring mental illness. They operated a key worker system in which every patient had a designated member of staff with lead responsibility for care co-ordination and delivery. Referrals were determined by geographical area and age limits.

Eligibility criteria for participating key workers were a professional qualification in mental health and/or a minimum of 1-year professional experience in an outpatient setting, and an active caseload as key worker. The caseloads of participating key workers were screened to identify suitable patients meeting the following inclusion criteria: living in the community (not 24 h supported accommodation) and treated as outpatients by community psychiatric teams; at least 3 months of continuous care in the current service; capable of giving informed consent; having sufficient
knowledge of the language of the host country; having a primary diagnosis of schizophrenia or related psychotic disorder (ICD-10 = F20–F29); aged between 18 and 65 years of age; having at least one meeting with their key worker every 2 months with the expectation that they would continue with the service for the next 12 months; and having no severe organic psychiatric illness or primary substance abuse. Patients were first informed about the study by their key worker and then – if they agreed – approached by a researcher for consent. The study was approved by the relevant research ethics committees in the six countries, and written informed consent was obtained from all key workers and patients in the study.

Intervention

Key workers in the control group continued with standard treatment with their participating patients. In addition to standard treatment key workers in the intervention group implemented a new manualized intervention called DIALOG. This was a computer-mediated procedure structuring patient–key worker communication to elicit patients’ satisfaction with eight life domains (mental health, physical health, accommodation, job situation, leisure activities, friendships, relationship with family/partner, personal safety) and three aspects of treatment (practical help, psychological help and medication). Satisfaction in each domain was rated on a 7-point rating scale, ranging from ‘couldnt be worse’ to ‘couldnt be better’, and followed by a question on whether the patient wanted any additional or different help in the specific domain. The intervention was applied every 2 months in meetings arranged as part of routine care.

Data collection

Outcome in the two groups was compared in a pre–post design at baseline and 12-month follow-up. Subjective quality of life was the primary outcome measure and rated on the Manchester Short Assessment of Quality of Life (7) containing 16 items, of which 12 assess satisfaction with life in general and different life domains using a 7-point scale ranging from ‘couldnt be worse’ to ‘couldnt be better’. The mean score of all 12 satisfaction ratings is taken as the indicator of overall subjective quality of life.

Secondary outcomes were number of unmet needs and satisfaction with treatment. Needs were measured using the Camberwell Assessment of Need Short Appraisal Schedule, patient rated version (8), which assesses health and social needs across 22 domains. For each domain it distinguishes between ‘no need’, ‘met need’ and ‘unmet need’. Patients’ satisfaction with treatment was assessed on the 8-item Client Satisfaction Questionnaire (CSQ-8) (9). Helping alliance was measured by a 6-item self-report questionnaire Helping Alliance Scale (HAS), developed by Priebe and Gruyters (10). Interviewers assessed patients’ symptoms on the Positive and Negative Syndrome Scale (PANSS) (11). Socio-demographic and clinical characteristics of patients were obtained at baseline. Psychiatric diagnosis was obtained using a standardized, computer-based method using operationalised criteria (12).

Statistical analysis

Descriptive statistics are presented with frequency and percentage distributions for categorical data and mean and standard deviations for continuous data. In order to investigate predictors of outcome regarding quality of life, needs and treatment satisfaction, a number of patient baseline characteristics were included in a series of two-way ANOVAs (13). Having shown a main intervention effect on the three aforementioned outcomes in an earlier paper, the main effects of a number of moderator variables and the interaction between these and the intervention were investigated. Interaction effects were analysed in order to explore whether any patient baseline characteristics moderated the effect of the intervention. Change scores over the 12-month follow-up period of unmet needs and quality of life, and follow-up scores of treatment satisfaction were used as dependent variables. The patient characteristics included were sex, age (median cut), marital situation (married/not married), employment situation (employed/un employed), living situation (dependent living/ independent living), duration of illness (median cut) and number of psychiatric hospital admissions (median cut), baseline assessments on symptoms (median cut) and patient ratings of helping alliance (median cut). The statistical software used was SPSS 14.0.

Results

From the key workers’ caseloads, 507 eligible patients agreed to take part, with 236 patients in TAU and 271 in the intervention group. At 12 months, 451 patients (243 intervention, 208 TAU) were re-interviewed, a follow-up rate of 88.9%. Social and clinical background.
characteristics of the patients in the control and intervention groups are presented in Table 1. There were no significant differences between the two groups.

In an earlier paper we demonstrated that DIALOG was superior to TAU with respect to subjective quality of life, unmet needs and treatment satisfaction. Table 2 displays the results from the current moderator analyses. Regarding the quality of life there was a main effect for symptoms; patients with more severe negative symptoms at baseline improved more on quality of life. There were also two moderator effects: patients with a better initial helping alliance and shorter duration of illness receiving DIALOG showed a greater improvement in subjective quality of life.

The results regarding unmet needs showed a main effect of reduction for patients who were more symptomatic at baseline. There were two moderator effects: patients in competitive employment and who had a shorter duration of illness receiving DIALOG showed a greater reduction in unmet needs.

Better treatment satisfaction at follow-up was related to a better initial helping alliance, fewer symptoms and not living in independent accommodation at baseline. Only one interaction effect was detected; older patients receiving DIALOG were more satisfied with treatment at follow-up.

### Discussion

The main purpose of the DIALOG study was to test the effectiveness of a novel intervention in community care for patients with schizophrenia and related psychotic disorders. To our knowledge this was the first study to investigate an intervention aimed at restructuring patient–key worker interaction in community mental health care across a range of healthcare systems, assessing outcome after 12 months (6). After 12 months, the intervention had a significant positive effect on three central outcomes, i.e. quality of life, unmet needs and treatment satisfaction.

In the present paper, we investigated moderators of the intervention, exploring whether treatment effects differed depending on social and clinical baseline patient characteristics. There is limited research on moderators of the effectiveness of psychosocial interventions in community-based mental health care. A few studies have explored moderators of outcome in the context of case management (14, 15), mainly focusing on treatment satisfaction and psychiatric symptoms. There is an obvious need to further develop more refined conceptual models to investigate moderators. Within the field of psychotherapy research the influence of client variables on psychotherapy outcome has been extensively researched, mostly using ad hoc hypotheses and frequently showing main effects of patient characteristics but rarely any patient characteristics moderating the effect of interventions (16).

In this study patients with a shorter duration of illness and a better baseline helping alliance, receiving the DIALOG intervention, improved more on subjective quality of life. Patients in

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**Table 1. Baseline demographic and clinical characteristics of patients**

<table>
<thead>
<tr>
<th>Characteristics of patients</th>
<th>Treatment as usual $(n = 236)$</th>
<th>Intervention $(n = 271)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>$41.8 \pm 11.6$</td>
<td>$42.5 \pm 11.3$</td>
</tr>
<tr>
<td>Gender (% female)</td>
<td>35.2</td>
<td>32.5</td>
</tr>
<tr>
<td>Marital status (% single)</td>
<td>83.9</td>
<td>89.3</td>
</tr>
<tr>
<td>Unemployed (%)</td>
<td>36.9</td>
<td>35.2</td>
</tr>
<tr>
<td>Independent living situation (%)</td>
<td>66.5</td>
<td>67.5</td>
</tr>
<tr>
<td>Duration of illness (years)</td>
<td>$15.2 \pm 9.9$</td>
<td>$16.6 \pm 10.5$</td>
</tr>
<tr>
<td>Number of hospital admissions</td>
<td>4.5 $\pm 6.9$</td>
<td>$5.8 \pm 7.6$</td>
</tr>
<tr>
<td>MANSAs (QoL)</td>
<td>4.7 $\pm 0.8$</td>
<td>4.7 $\pm 0.8$</td>
</tr>
<tr>
<td>CANSAs (unmet needs)</td>
<td>25.7 $\pm 4.2$</td>
<td>25.7 $\pm 4.1$</td>
</tr>
<tr>
<td>PANSS (symptoms total score)</td>
<td>62.2 $\pm 17.4$</td>
<td>64.8 $\pm 19.8$</td>
</tr>
<tr>
<td>HAS (helping alliance)</td>
<td>8.1 $\pm 1.6$</td>
<td>8.0 $\pm 1.7$</td>
</tr>
</tbody>
</table>

MANSAs, Manchester Short Assessment of Quality of Life; CANSAs, Camberwell Assessment of Need Short Appraisal Schedule; HAS, Helping Alliance Scale.

**Table 2. Moderator analyses for unmet needs, quality of life and treatment satisfaction**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Quality of life $F$, $P$</th>
<th>Unmet needs $F$, $P$</th>
<th>Treatment satisfaction $F$, $P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.94, 0.334</td>
<td>0.24, 0.676</td>
<td>3.68, 0.058</td>
</tr>
<tr>
<td>Gender × intervention</td>
<td>0.24, 0.622</td>
<td>0.06, 0.814</td>
<td>0.32, 0.572</td>
</tr>
<tr>
<td>Age</td>
<td>1.13, 0.287</td>
<td>1.32, 0.251</td>
<td>1.96, 0.162</td>
</tr>
<tr>
<td>Age × intervention</td>
<td>0.01, 0.924</td>
<td>1.21, 0.272</td>
<td>8.22, 0.004</td>
</tr>
<tr>
<td>Living situation</td>
<td>0.04, 0.840</td>
<td>3.49, 0.063</td>
<td>14.11, 0.001</td>
</tr>
<tr>
<td>Living situation × intervention</td>
<td>0.54, 0.463</td>
<td>0.04, 0.842</td>
<td>0.27, 0.607</td>
</tr>
<tr>
<td>Marital status</td>
<td>2.43, 0.120</td>
<td>0.01, 0.995</td>
<td>0.22, 0.638</td>
</tr>
<tr>
<td>Marital status × intervention</td>
<td>0.26, 0.626</td>
<td>2.75, 0.098</td>
<td>0.24, 0.625</td>
</tr>
<tr>
<td>Employment</td>
<td>0.01, 0.934</td>
<td>1.04, 0.309</td>
<td>1.30, 0.256</td>
</tr>
<tr>
<td>Employment × intervention</td>
<td>0.78, 0.379</td>
<td>3.99, 0.047</td>
<td>1.28, 0.258</td>
</tr>
<tr>
<td>Duration of illness</td>
<td>2.32, 0.129</td>
<td>0.10, 0.757</td>
<td>0.68, 0.412</td>
</tr>
<tr>
<td>Duration of illness × intervention</td>
<td>4.26, 0.040</td>
<td>10.14, 0.002</td>
<td>0.01, 0.994</td>
</tr>
<tr>
<td>Psychiatric hospital admissions</td>
<td>0.07, 0.791</td>
<td>0.90, 0.341</td>
<td>1.15, 0.284</td>
</tr>
<tr>
<td>Psychiatric hospital admissions × intervention</td>
<td>0.03, 0.857</td>
<td>0.10, 0.927</td>
<td>1.35, 0.247</td>
</tr>
</tbody>
</table>

*Two-way ANOVA, significant $P$ values in bold.
competitive employment or those with a shorter duration of illness benefited more from DIALOG with respect to unmet needs. Treatment satisfaction at follow-up was moderated by age: older patients receiving DIALOG were more satisfied with treatment.

In addition, a number of main effects were revealed indicating that, irrespective of the type of intervention, certain subgroups benefited more from community-based care. Patients with more negative symptoms at baseline improved more on quality of life, patients who were more symptomatic generally at baseline showed a greater reduction in unmet needs, and patients, with fewer symptoms, a better helping alliance and those in supported housing at baseline were more satisfied with treatment at follow-up.

Given the general lack of research on moderators of psychosocial interventions in community-based mental health care, the conclusion from the present results of a novel intervention, although limited, have something to contribute. Tentatively, patients with a shorter duration of illness, a better relationship with their key worker and a better social situation in terms of competitive employment seem to benefit more from structuring patient–key worker communication and elicit patients’ satisfaction and needs for care. This suggests that DIALOG would be most beneficial to the patients in a more acute phase of illness, who are more integrated in society, and who have a better relationship with their key worker. The latter is in line with results from an observational study by Little et al. (17), showing a relationship between outcome and patients’ perceptions of the provider having a patient-centred and positive approach. These results may also indicate that for patients with a more chronic and longstanding illness it might be harder to change the communication patterns.

The design of the study did not allow us to test whether specific elements of the intervention were related to these moderator effects, because the intervention was delivered as a package. We have proposed that the distinct elements of DIALOG are: i) structuring patient–key worker meetings to ensure that important areas of needs and treatment are always covered; ii) the focus on patient views of treatment and outcome, and iii) immediate feedback of current ratings on a computer screen along with comparisons of current ratings with previous ones across different life domains.

A limitation of the present study is that the analyses were performed post-hoc in order to further explore the main findings of the study. Hence, the moderator variables were not derived from specific theoretical considerations or the hypothetical influence of certain moderators, based on earlier research. However, given that there is almost no existing evidence from mental health research, these findings indicate that patient characteristics moderating outcome may be of relevance for understanding and targeting complex interventions.

In conclusion, the effectiveness of a new computer-mediated procedure structuring routine patient–key worker communication was moderated by specific patient characteristics. Moreover, the moderating characteristics varied depending on the specific outcome. Although of potential importance for targeting and implementation of such interventions, research on moderators of the effectiveness of community-based psychosocial interventions is very limited. This would call for further intervention research specifically addressing the issue of moderators, and by extension mediators, of effectiveness.

Acknowledgements


References